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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/732,282	12/07/2000	John Michael Miller	200-0459	9416

7590 11/30/2001

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EXAMINER

CORRIGAN, JAIME W

ART UNIT	PAPER NUMBER
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3748

DATE MAILED: 11/30/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/732,282

Applicant(s)

MILLER, JOHN MICHAEL

Examiner

Jaime W Corrigan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 9, 10 and 13-18 is/are rejected.
- 7) ☒ Claim(s) 7, 8, 11 and 12 is/are objected to.
- 8) ☒ Claim(s) 19-21 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 5) ☒ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-18, drawn to rotary electric actuator, classified in class 251, subclass 129.11.
- II. Claims 19-21, drawn to remote or follow up control system for electrical actuator, classified in class 251, subclass 129.04.

Inventions of Group I and Group II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus as claimed can be used to practice another and materially different process such as one that doesn't require current recirculation.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

During a telephone conversation with John Buckert on 10-31-01 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-18. Affirmation of this election must be made by applicant in replying to this Office action. Claims 19-21 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 13, 15, 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Beblavi (PN 4452423).

Regarding claims 1, 15 Beblavi discloses a rotor (See Figure 1A (28), (47)) centered about a first axis having a bore extending generally axially therethrough (See Figure 1A Not numbered but clearly visible); a stator operatively disposed about said rotor for producing a torque to cause rotation of said rotor about said first axis (See Figure 1A (36), (38); Figure 3 (36), (38)); and, a valve having a valve stem (See Figure 1A (49) and a valve head (See Figure 1A (24)), said valve stem extending generally axially through said bore of said rotor, said valve configured to move generally axially responsive to the rotation of said rotor to selectively engage and disengage said valve head with a valve seat of said engine (See Column 5 Lines 20 – 30).

Regarding claims 2, 16 Beblavi discloses a rotor includes a first helical groove (See Figure 1A Not numbered but clearly visible) and said valve stem includes a second complementary helical groove (See Figure 1A Not numbered but clearly visible), said first and second helical grooves forming a first raceway between said rotor and said valve stem (See Figure 1A Not numbered but clearly visible), said valve assembly

further in including ball bearings (See Column 4 Lines 42- 68) disposed in said first raceway that allow axial movement of said valve responsive to rotation of said rotor.

Regarding claim 4 Beblavi discloses said valve stem is threadably engaged with said rotor (See Figure 1A (49), (28), (47)).

Regarding claim 13 Beblavi discloses a rotor (See Figure 1A (28), (47)) centered about a first axis having a bore extending generally axially therethrough, said rotor having a first helical groove (See Figure 1A Not numbered but clearly visible); a stator operatively disposed about said rotor for producing a torque to cause rotation of said rotor about said first axis (See Figure 1A (36), (38); Figure 3 (36), (38)), said stator being formed of a plurality of laminated plates (See Figure 1A (36); Column 3 Lines 23-27) a valve having a valve stem (See Figure 1A (49) and a valve head (See Figure 1A (24)), said valve stem extending generally axially through said bore of said rotor, said valve stem having a second helical groove (See Figure 1A Not numbered but clearly visible), said first and second helical grooves forming a raceway between said rotor and said valve stem for holding ball bearings therein, and, a plurality of ball bearings disposed within said raceway wherein said valve moves axially responsive to rotation of said rotor (See Column 4 Lines 42- 68).

Claim 14 is rejected under 35 U.S.C. 102(b) as being anticipated by Lund (PN 4097786).

Regarding claim 14 Lund discloses a rotary electric actuator having a rotatable ballnut (See Figure 5 (155); Column 6 Lines 8- 26) and a valve having a valve stem (See Figure 5 (157)) and a valve head (See Figure 5 (161)), said valve stem operatively

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connected to said ballnut (See Column 6 Lines 8-26), said valve stem configured to move generally axially responsive to the rotation of said ballnut to selectively engage and disengage said valve head with a valve seat of said engine (See Abstract; Column 6 Lines 8-26) .

Claim 17 is rejected under 35 U.S.C. 102(b) as being anticipated by Miyoshi (PN 5983847).

Regarding claim 17 Miyoshi discloses a valve controller for generating a commanded valve position current to control the incremental axial position of said valve (See Figure 3; Column 2 Lines 17- 22); and, a position sensor (See Figure 4 (40)) generating a signal responsive to an axial position of said valve, and, wherein said valve controller can vary a valve operational parameter of said valve independent of displacement of said engine pressure boundary (See Column 2 Lines 17- 22).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beblavi (PN4452423) in view of Lindner (PN 5832944).

Beblavi discloses the invention as recited in claims 1-2 above, however, fails to disclose the rotor is further configured to recirculate said ball bearings from an end position in said first raceway to a start position in said raceway.

Lindner teaches that it is conventional in the art to utilize the rotor is further configured to recirculate said ball bearings from an end position in said first raceway to a start position in said raceway (See Figure 1 (21); See Column 5 Lines10-13)).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the recirculating ball bearings taught by Lindner in the Bevlavi device since it would keep friction forces exerted on the lateral surfaces of the thread as small as possible.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beblavi (PN 4452423) in view of Lange (PN 5485760).

Beblavi discloses the invention as recited in claims 1-2 above, however, fails to disclose the valve stem has multiple lead engagements.

Lange teaches that it is conventional in the art to utilize the valve stem has multiple lead engagements (See Column 2 Lines 20-21).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the multiple lead engagements taught by Lange in the Bevlavi device since it would allow more accurate control of the valve stem.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beblavi (PN 4452423) in view of Reinicke (PN 5318064).

Beblavi discloses the invention as recited in claim 1 above, however, fails to disclose the rotor includes an outer ring magnet and an inner ballnut adjacent said ring magnet, said inner ballnut defining said bore.

Reinicke teaches that it is conventional in the art to utilize the rotor includes an outer ring magnet (See Figure 1 (42), (43) and an inner ballnut (See Figure 1 (35)) adjacent said ring magnet, said inner ballnut defining said bore (See Figure 1 (32), (35)).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the rotor includes an outer ring magnet and an inner ballnut adjacent said ring magnet, said inner ballnut defining said bore taught by Reinicke in the Beblavi device since it would allow for more efficient use of energy for activating the valve

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beblavi (PN 4452423) in view of Feucht (PN 5606957).

Beblavi discloses the invention as recited in claim 1 above, however, fails to disclose an anti-twist guide for preventing the valve stem from rotating about said first axis.

Feucht teaches that it is conventional in the art to utilize the rotor includes an anti-twist guide for preventing the valve stem from rotating about said first axis (See Figure1 (38); Column 2 Lines 27-30).

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the anti-twist guide taught by Feucht in the Beblavi device since it would prevent premature valve wear.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beblavi (PN 4452423) in view of Ackerman (PN 6109589).

Beblavi discloses the invention as recited in claim 1 above, however, fails to disclose a position sensor for determining a rotational position of said rotor.

Ackerman teaches that it is conventional in the art to utilize a position sensor for determining a rotational position of said rotor (See Column 1 Lines 46-49).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the rotation position sensor of the rotor taught by Ackerman in the Beblavi device since it would allow for greater control of the rotor.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyoshi (PN 5983847) in view of Bonvallet (PN 4777915).

Miyoshi discloses the invention as recited in claim 17 above, however, fails to disclose the valve operational parameter includes one of a dwell time, an opening rate, a closing rate, an open dwell position, and an initial opening time.

Bonvallet teaches that it is conventional in the art to utilize the valve operational parameter includes one of a dwell time, an opening rate, a closing rate, an open dwell position, and an initial opening time (See Column 7 Lines 39-42).

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the valve operational parameter includes one of a dwell time, an opening rate, a closing rate, an open dwell position, and an initial opening time taught by Bonvallet in the Miyoshi device since it would improve fuel efficiency and valve durability.

Allowable Subject Matter

Claims 7-8, 11-12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hirt (PN 4256065), Kato (PN 6224034) use similar valve actuation systems.

Any inquiry concerning this communication from the examiner should be directed to Examiner Jaime Corrigan whose telephone number is (703) 308-2639. The examiner can normally be reached on Monday - Friday from 8:30 a.m. – 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion, can be reached on (703) 308-2623. The fax number for this group is (703) 308-7763.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0861.

JC

Jaime Corrigan

Jaime Corrigan
Patent Examiner

November 19, 2001

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Ths Den
THOMAS DENION
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700

Interview Summary	Application No.		Applicant(s)	
	09/732,282		MILLER, JOHN MICHAEL	
	Examiner		Art Unit	
	Jaime W Corrigan		3748	

All participants (applicant, applicant's representative, PTO personnel):

- (1) Jaime W Corrigan. (3) _____
 (2) John Buckert. (4) _____

Date of Interview: 31 October 2001 .

Type: a) ☒ Telephonic b) ☐ Video Conference
 c) ☐ Personal [copy given to: 1) ☐ applicant 2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☐ No.
 If Yes, brief description: _____ .

Claim(s) discussed: 1-21 .

Identification of prior art discussed: None .

Agreement with respect to the claims f) ☒ was reached. g) ☐ was not reached. h) ☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: Applicant's attorney agreed to elect claims 1-18 without traverse .

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

i) ☐ It is not necessary for applicant to provide a separate record of the substance of the interview(if box is checked).

Unless the paragraph above has been checked, THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

 Examiner's signature, if required